

Cargoa cupella, New Genus and New Species of Nudibranch
from Chesapeake Bay and the Generic Status
of *Okenia* MENKE, *Idalia* LEUCKART and *Idalla* ØRSTED¹

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(5 Text figures)

DURING A STUDY of the literature concerning the identity of a rare nudibranch collected in Chesapeake Bay, it was observed that species in this relationship (Suborder Eudoridacea, Superfamily Suctoria, Family Goniadorididae) were usually placed in the genus *Idalia* LEUCKART, 1828 or in *Okenia* MENKE, 1830. An attempt was made to determine the valid generic taxon available for the species in this group.

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The nomenclatural history of this group is given below. Only the more important references are cited in the synonymy.

Cargoa VOGEL & SCHULTZ, gen. nov.

Type species: *Cargoa cupella* VOGEL & SCHULTZ, spec. nov.

We are pleased to name this new genus in honor of our colleague, David G. Cargo, Chesapeake Biological Laboratory, Solomons, Maryland.

Okenia LEUCKART in BRONN, 1826, *Ergebn. Reisen*, vol. 1, p. 329 (*O. elegans* LEUCKART, nomen nudum).

Okenia MENKE in IREDALE & O'DONOGHUE, 1923, *Proc. Malacol. Soc. London*, vol. 15, prt. 4, pp. 197, 217 (nomenclature, preoccupied in Diptera by *Okenia* ZETTERSTEDT, 1838). – MENKE in BABA, 1937, *Nov. Journ. Dept. Agric. Kyushu Impl. Univ.*, vol. 5, p. 295 (Type-species designated, *Idalia elegans* LEUCKART). – PRUVOT-FOL, 1954, vol. 58, p. 308. – MARCUS, 1957, *Journ. Linn. Soc. London*, vol. 3, p. 436 (nomenclature). – MACNAE, 1957, *Trans. Roy. Soc. South Africa*, vol. 35, p. 368 (nomenclature).

Idalia LEUCKART, 1828, *Breves anim. quorund. descr.* p. 15, fig. 2a, 2b. (Type-species, *I. elegans* LEUCKART, p. 15; preoccupied by *Idalia* HUEBNER, 1819 and *Idalia* HUEBNER, 1825, in Lepidoptera, ref. copied from NEAVE). – MENKE, 1830, *Synop. Method. Mollusc.* p. 10 (“*Idalia* LEUCKART = *Okenia* LEUCKART”). – PHILIPPI, 1844, *Fauna Moll.*, p. 76 (genus described; 6 species listed). – FORBES & HANLEY, 1853, *History Brit. Moll.*, vol. 3, p. 578. – ALDER & HANCOCK, 1855, *Monogr. Brit. Moll.*, genus 8, family 1, (genus divided in two sections. Sec. 1 is desig-

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nated "Type, *I. elegans*," plt. 27, figs. 1 - 5; also see app. p. xviii; Sec. 2, "Type, *I. aspersa*," plt. 26, figs. 1 - 10, which BERGH, 1881 placed in *Idaliella* BERGH). - BERGH, 1881, p. 142, subgenus on p. 144 (*Idalia*). - BERGH, 1883, Beiträge Monog. Polyceraden, Wien, p. 41, (subgenus *Idalia*, p. 42). - ELIOT, 1910, Brit. Nudibranch. Moll., pt. VIII (suppl.), p. 158 (continued to divide genus into 2 subgenera following BERGH, 1881).

Idalina NORMAN, 1890, Ann. Mag. Nat. Hist., ser. 6, vol. 6, p. 74 (replaces *Idalia* LEUCKART, 1828; *Idalina* NORMAN preoccupied in Protozoa by *Idalina* MUNIER-CHALMAS & SCHLUMBERGER, 1884, ref. copied from NEAVE); - IREDALE & O'DONOGHUE, 1923, Proc. Malacol. Soc. London, vol. 15, prt. 4, p. 197, ("*Idalina* is altered to *Okenia*").

Diagnosis: The new genus *Cargoa* is distinguished from other genera in the family Goniadorididae by the combination of the following characters: Tentacles clavate or linear; leaves present on non-retractile rhinophores; non-retractile gills present; one row of papillae present on each side on a pallial ridge; one or more dorsal papillae present on back. Additional characters of the type-species are those of the new genus.

Okenia LEUCKART in BRONN (1826) is a nomen nudum because *O. elegans* LEUCKART (1826) was without description. Only a name was listed.

MENKE (1830) listed *Idalia* LEUCKART = *Okenia* LEUCKART, also without a description. *Okenia* here is a synonym of *Idalia*. However, it is not available as of MENKE (1830) because in the Code, Art. 10d, "A name first published as a synonym is not thereby made available." The Code, Art. 16b, ii, also covers this problem. We quote Art. 16b, "The following are not 'indications' in the meaning of this chapter: (ii) citation of a name in synonymy [Art. 11d]." We conclude therefore that *Okenia* MENKE (1830) is not available. *Okenia* MENKE next appeared in IREDALE & O'DONOGHUE (1923) and in BABA (1937), the latter designated *I. elegans* LEUCKART as type-species. However, if *Okenia* MENKE in IREDALE & O'DONOGHUE (1923) or in BABA (1937) is considered valid, it is preoccupied in Diptera by *Okenia* ZETTERSTEDT, 1838.

NORMAN in 1890 proposed *Idalina* to replace *Idalia* LEUCKART, 1828, but *Idalina* NORMAN, 1890 is preoccupied by *Idalina* MUNIER-CHALMAS & SCHLUMBERGER, 1884.

LEUCKART in 1828 proposed *Idalia elegans* and gave a description, but *Idalia* is preoccupied in Lepidoptera by *Idalia* HUEBNER, 1819. BERGH in 1881 accepted *Idalia* LEUCKART but divided it into two subgenera, naming one

of them *Idaliella* with *I. aspersa* (ALDER & HANCOCK) as the type-species. The latter species differs from *Idalia elegans* by lacking a mid-dorsal papilla, whereas *I. elegans* has one or more papillae on the back. This difference is great enough to indicate two distinct genera.

We conclude that the group of species usually referred by authors to *Idalia* or *Okenia* is without an available generic name. Thus we now propose *Cargoa*, new genus with the type-species, *Cargoa cupella*, new species. This new genus is not a replacement name for either *Idalia* or *Okenia*.

We believe that the following species should be assigned to the new genus, *Cargoa*:

- C. elegans* (LEUCKART, 1828) (type-locality, Mediterranean).
- C. cirrigera* (PHILIPPI, 1839) (type-locality, Sicily).
- C. leachii* (ALDER & HANCOCK, 1854) (type-locality, Torbay, Whitburn, Durham, Hebrides).
- C. tentaculata* (STIMPSON, 1855) (type-locality, China).
- C. mediterranea* (IHERING, 1886) (type-locality, near Naples, Mediterranean).
- C. plebia* (BERGH, 1902) (type-locality, coast of Lem Ngob, Siam).
- C. dautzenbergi* (VAYSSIÈRE, 1919) (type-locality, Gulf of Marseille, Mediterranean).
- C. vancouverensis* (O'DONOGHUE, 1921) (type-locality, Nanaimo, Vancouver Island, British Columbia, Rosepit, north end of Queen Charlotte Islands).
- C. distincta* (BABA, 1940) (type-locality, Asamusi, Japan).
- C. japonica* (BABA, 1949) (type-locality, off Sajima, Sagami Bay, Japan).
- C. echinata* (BABA, 1949) (type-locality, off Sajima, Sagami Bay, Japan).
- C. evelinae* (MARCUS, 1957) (type-locality, Ubatuba and Ilhabela, Brazil; Florida).
- C. impexa* (MARCUS, 1957) (type-locality, Island of São Sebastião, and Ubatuba, Brazil).
- C. opunta* (BABA, 1960) (type-locality, Tannowa, Osaka Bay, Japan).
- C. plana* (BABA, 1960) (type-locality, Toba, Japan, and Kada, Osaka Bay, Japan).
- C. babai* (HAMATANI, 1961) (type-locality, Tannowa, Osaka Bay, Japan).
- C. angelensis* (LANCE, 1966) (type-locality, Bahía de Los Angeles, Estado de Baja California, Mexico).
- C. pellucida* (BURN, 1967) (type-locality, Sidney Harbour, New South Wales).
- C. mija* (BURN, 1967) (type-locality, Point Danger, Torquay, Victoria).
- C. sapelona* (MARCUS & MARCUS, 1967) (type-locality, Sapelo Island, Georgia).

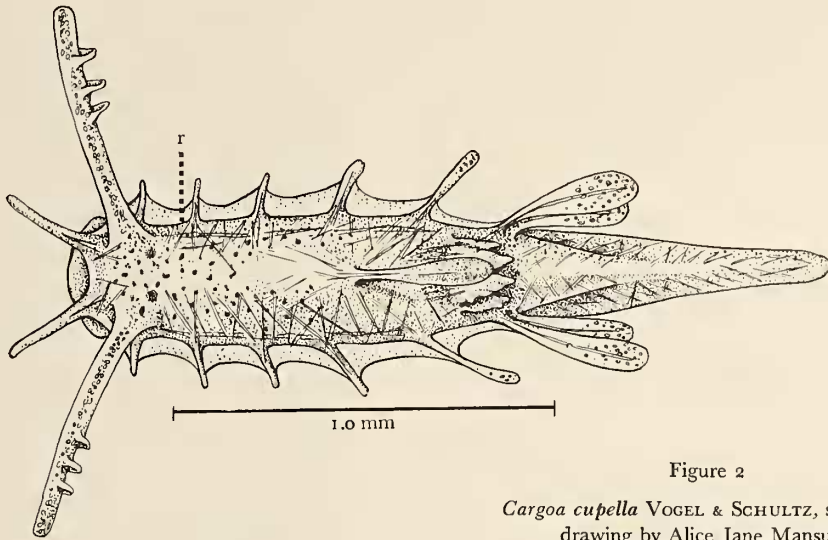


Figure 2

Cargoa cupella VOGEL & SCHULTZ, spec. nov.
drawing by Alice Jane Mansueti

Dorsal view of holotype, USNM 679396

r - reproductive openings on right side
beneath second lateral papilla (not shown in drawing)

tending past the base of the mid-dorsal papilla. The longest branchia (middle two) are $\frac{1}{2}$ the length of the rhinophores. The rhinophores are approximately 0.7 mm long.

The radula is composed of approximately 10 rows of 4 teeth each. The dental formula is 1:1:0:1:1. The teeth are pointed posteriorly. On the inner edge of the inner lateral teeth are 9 denticles.

Four specimens of this species were found crawling on an oyster shell containing *Chrysaora quinquecirrha* polyps and other common fouling organisms. The shell was col-

lected at Aberdeen Rock, York River, Virginia, on 1 November 1968. The salinity was 20‰. These nudibranchs were kept alive in aquaria for observation of their behavior and to have drawings made of them. During a 10-day period 2 were lost before they could be dissected, one was preserved (holotype), and the radula was dissected from the other one. The 2 specimens that disappeared showed little or no variability from the holotype.

One animal laid an egg mass that was attached along its lower part to the side of the glass bowl. It was 1 mm in length, oval in shape, and contained approximately 40 white eggs, that developed to beyond the 32-cell stage and then died.

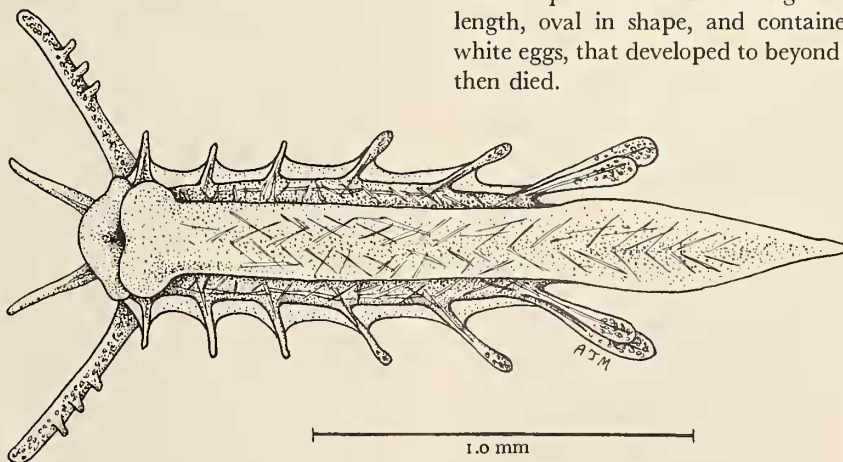


Figure 3

Cargoa cupella VOGEL & SCHULTZ, spec. nov.
drawing by Alice Jane Mansueti

Ventral view of holotype, USNM 679396

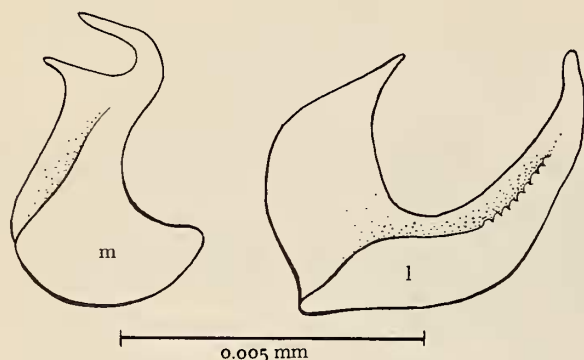


Figure 4

Cargoa cupella VOGEL & SCHULTZ, spec. nov.

drawing by Alice Jane Mansueti

Radula of paratype, USNM 679397

l - lateral tooth

m - marginal tooth

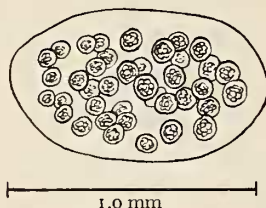


Figure 5

Cargoa cupella VOGEL & SCHULTZ, spec. nov.

drawing by Alice Jane Mansueti

Egg mass

The animals were exposed to *Chrysaora quinquecirrha* polyps, several sponges and hydroids, in an effort to see what they ate. None of these items were seen taken by the nudibranchs.

Remarks:

This new species differs from the other members of the genus by having 3 to 5 cup-shaped leaves on the rhinophores, whereas *Cargoa evelinae* and *C. sapelona* have 6; *C. plebia* has 25; *C. vancouverensis* has 28 - 30; *C. impexa* has 8 or 9; *C. pellucida* has 7 - 12; *C. babai* and *C. mija* have 4 - 6. The species - *C. elegans*, *C. cirrigera*, *C. leachii*, *C. mediterranea*, *C. distincta*, *C. japonica*, and *C. opunta*, all have perfoliate rhinophores, whereas *C. cupella* has 3 to 5 cup-shaped leaves on the rhinophores.

Both *Cargoa cupella* and *C. tentaculata* possess 4 gills, one dorsal papilla, and one pair of anterior tentacles. However, *C. tentaculata* differs by having large, clavate rhinophores in contrast to the slender, cylindrical rhinophores bearing 3 to 5 leaves for *C. cupella*. *Cargoa tentaculata* is wine yellow with brownish spots along each side of the flake-white median line. It has chestnut brown rhinophores and gills. *Cargoa cupella*, in contrast, is whitish with bright white spots concentrated in the rhinophores and papillae. It also has dark brown or black spots dorsally from the rhinophores almost to the gills.

While this paper was in the hands of the editor, 2 additional specimens of *Cargoa cupella* were collected November 4, 1969, one from the Manokin River, and another from Deal Island; this latter specimen was dead and deteriorating. The former, 4 mm in length, had 5 cup-shaped leaves on each rhinophore. This indicates that the cup-shaped leaves of *C. cupella* may increase in number with increase in length. Therefore, among the 20 other species referred to the genus *Cargoa*, the number of leaves 3 to 6 on *C. evelinae*, *C. mija*, and *C. sapelona*, overlap with the number 3 to 5 as found on *C. cupella*. The latter differs by having only one large club-shaped papilla on the mid-dorsal line which distinguishes it from *C. evelinae*, *C. mija*, and *C. sapelona*, which have 4, 9 and 5, respectively.

This new species is named *cupella* (gender, feminine) in reference to the small, cup-shaped leaves on the rhinophores.

Idalla ØRSTED, 1844

During our investigation of the nomenclatural history of *Idalia* and *Okenia*, we noted that ØRSTED (1844, p. 73) listed *Idalla caudata* ØRSTED from Kullen, Sweden. In a footnote, which we translate, he described the species as follows:

Body oblong, much higher than wide, golden, tail slender and curved upward, 3 simple lappets on both sides dorsally, 6 tentacular appendages, whereby 2 longer are double, 8 anal gills, length 4 - 5 mm, width 2 mm.

It should be noted that he does not mention a mid-dorsal papilla as found in *Cargoa*. The other characters of *Idalla caudata* indicate that it should be referred to the group of species included in *Idaliella* BERGH, 1881. In reviewing the nomenclatural history of *Idaliella* BERGH (1881, p. 145), we found that *Idalla* ØRSTED has priority over the usually recognized genus *Idaliella* with *Idalia aspersa* ALDER & HANCOCK, 1855 as the type-species.

The following species, among others are referred to this genus: *I. caudata* ØRSTED; *I. aspersa* (ALDER & HANCOCK);

I. pulchella (ALDER & HANCOCK); *I. fusca* (ODHNER); *I. inaequalis* (FORBES & HANLEY); *I. quadricornis* (MONTAGU); *I. amoenua* (BERGH); *I. barnardi* (BABA).

Some authors have placed *Euplocamus* PHILIPPI, 1836 (type-species, *E. croceus* PHILIPPI; preoccupied by *Euplocamus* LATREILLE, 1809 in Lepidoptera) with *Idaliella*. We do not think the two genera are the same because *E. croceus* does not belong zoologically with the species herein referred to *Idalla*.

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